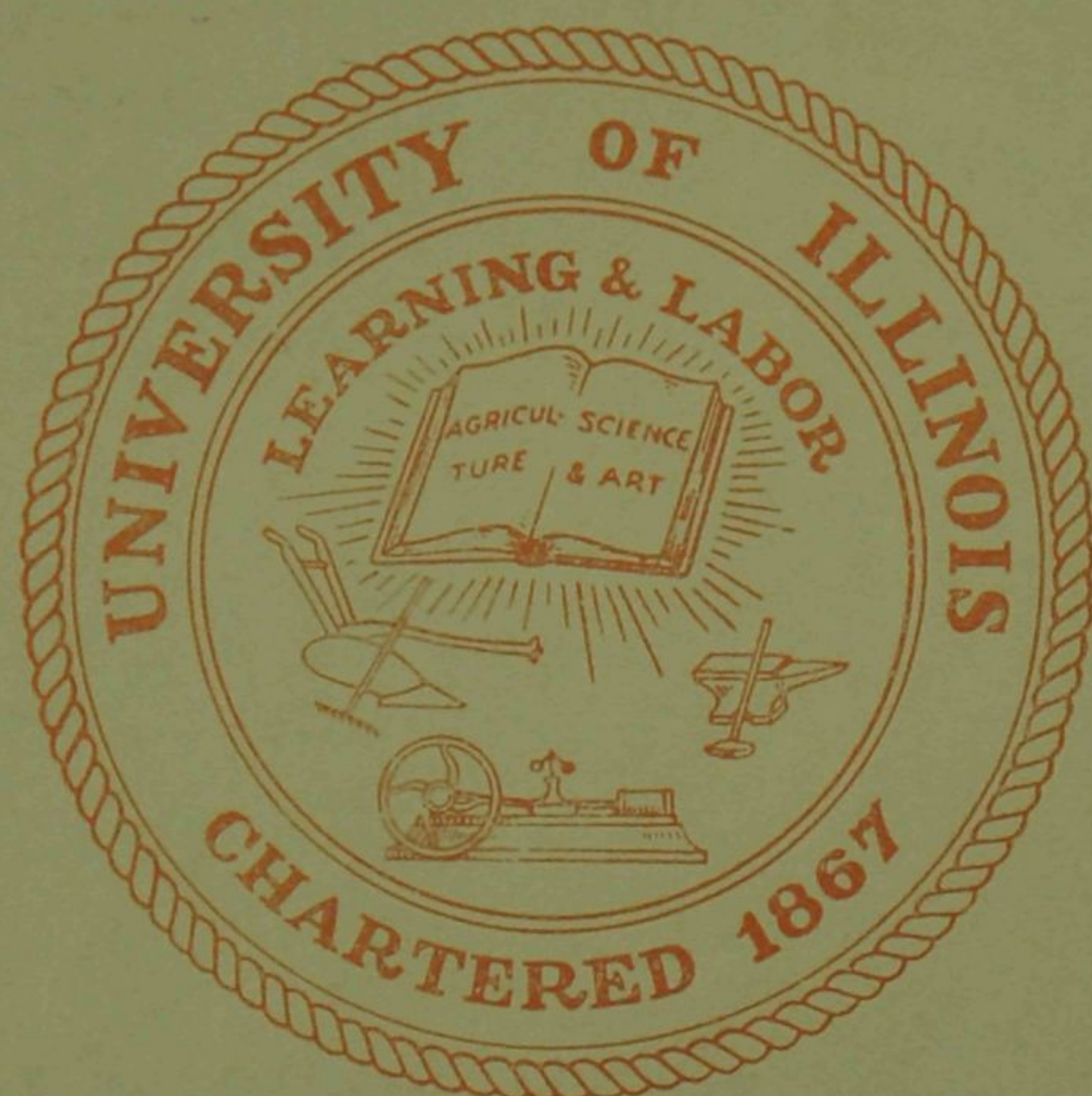


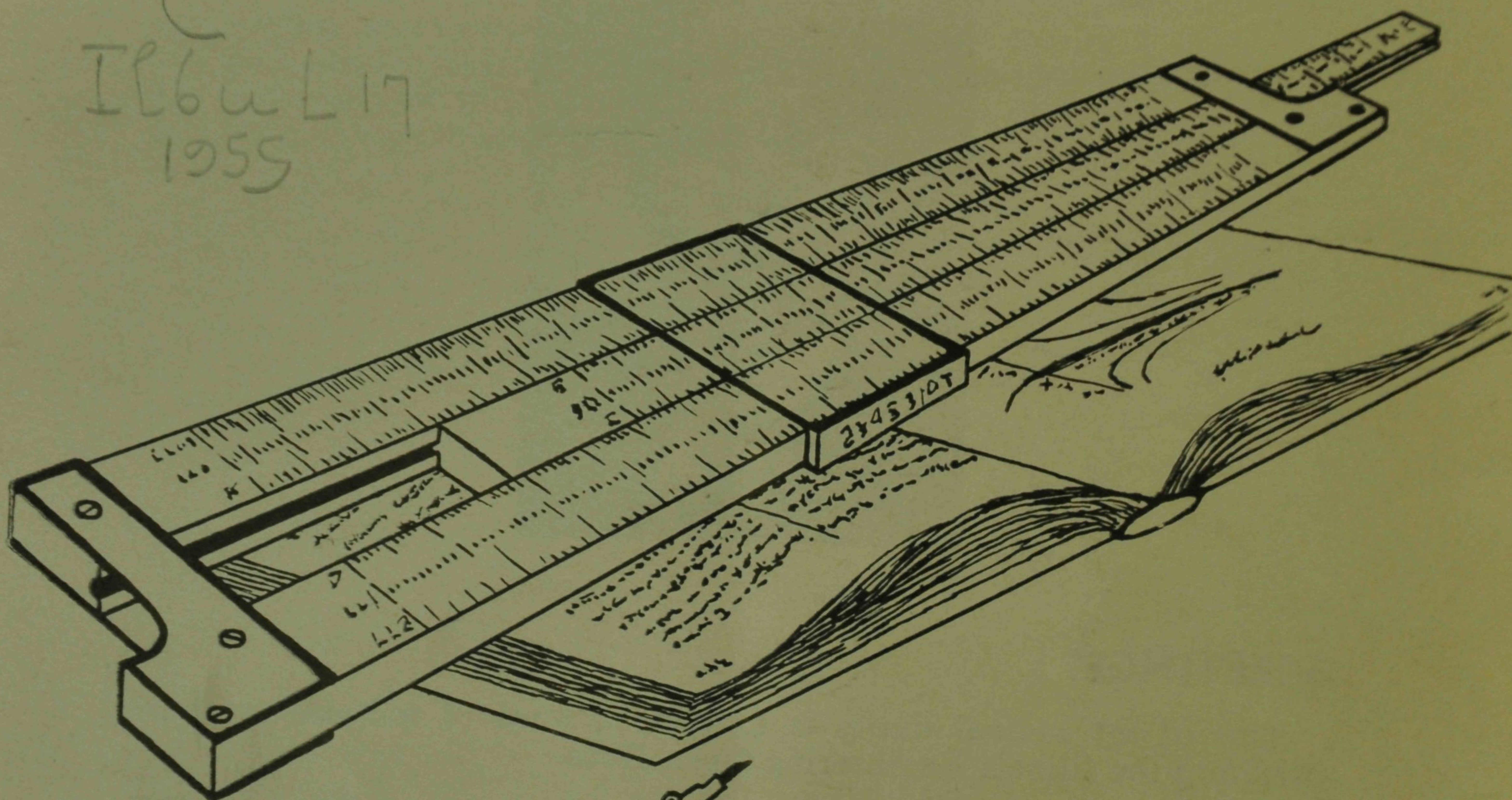
UNIVERSITY OF ILLINOIS



COLLEGE OF ENGINEERING

ENGINEERING OPEN HOUSE

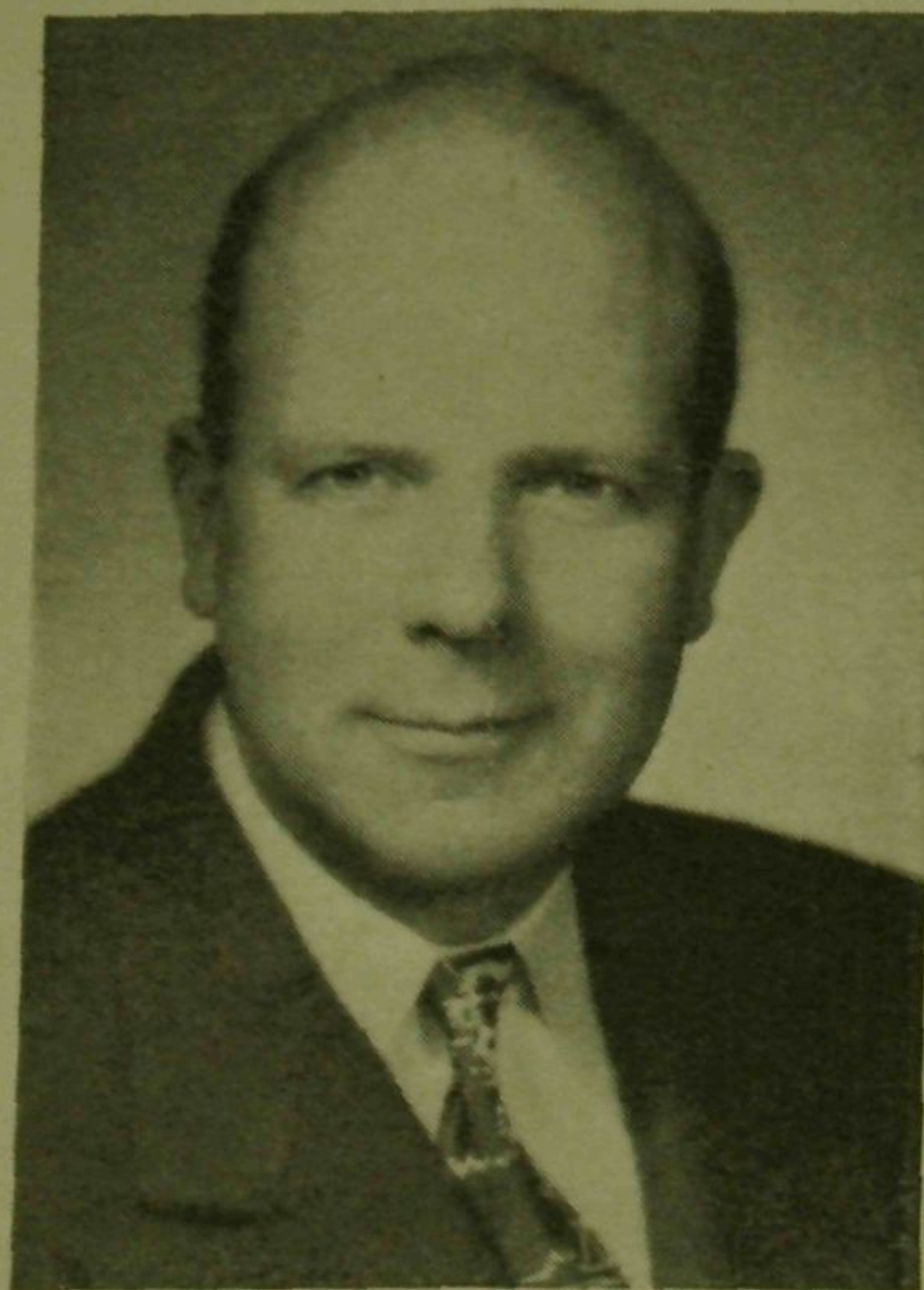
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1955



PRESENTED
BY THE STUDENTS
& FACULTY AT THE
UNIVERSITY OF
ILLINOIS

MARCH 11 & 12, 1955

WELCOME TO OUR SHOW . . .



GREETINGS!

One of my annual duties is to write a word of welcome to those attending the Illinois Engineering Open House.

It is not really a duty. It is a pleasure. For we are glad to have you with us, and glad of the opportunity to show—by sample—something of what engineering is like and what kinds of preparation the engineer needs in his high school and college work.

I say “by sample.” The province of engineering is so great that even this extensive exhibition which you are viewing can give only an incomplete notion of what the engineer does.

The exhibits are arranged on a departmental basis. This is in accordance with the way we teach future engineers. And it is a good way. But the most important thing about an engineer is not whether he is an agricultural or a civil or a mechanical engineer, or a member of one of the many other branches. The most important thing is the combination of qualities that he shares with his fellow engineers. I mean the combination of complete honesty in dealing with facts and men, an inquiring mind, a creative spirit, persistence, and the desire to be of service to mankind. Along with these goes his habitual use of a method of approaching problems which we like to call The Engineering Method. Actually it is not greatly different from the ways in which all intelligent men tackle their own problems—except for the engineer’s constant and rigorous use of mathematical procedures.

The great dependence of the engineer upon mathematics is indicated in this year’s Open House by an exhibit from the Department of Mathematics. One of the myriad of relationships between engineering and industry is indicated by the train which, with the cooperation of other systems, the Illinois Central Railroad has brought from Chicago for you to view.

Behind all these exhibits we hope you will see the spirit of engineering—the spirit of practical creative thinking, *esprit de corps*, initiative, cooperation, and service.

We hope, too, that this spirit, as well as the fine physical facilities of the University of Illinois, will lead you to visit us again, not only once but often. You will always be heartily welcome.

W. L. EVERITT
Dean, College of Engineering

... HERE IS SOME INFORMATION ...

Before we start on our tour through the numerous exhibits, here are a few notes intended to help make your visit more pleasant.

TIME OF OPERATION

The Open House exhibits will be presented from 10 A.M. to 10 P.M. on Friday, March 11, and from 8 A.M. to 4 P.M. on Saturday, March 12.

INFORMATION

The central headquarters office of the Engineering Open House is located on the ground floor of Civil Engineering Hall in Room 114. If you wish any information concerning the Open House, you may stop there or at any of the information desks located at the entrance of every building. At the central headquarters information on entrance requirements, programs for the various departments, University catalogues, and other points of information valuable to prospective students at Illinois are also available. Do not hesitate to ask any of the instructors or staff members present any questions you have about enrolling at Illinois. This is your Open House!

PARKING

Parking stickers for cars and busses are available at the central headquarters in Room 114 Civil Engineering Hall. These stickers will permit parking in any University parking lot. For parking information contact central headquarters upon your arrival.

REGISTRATION OF VISITORS

Visitor registration sheets, which are a great help in planning our future programs, are placed at the information desks in each building. If you did not register when you received this program, please go to the nearest desk and do so. We also would greatly appreciate your comments and suggestions on any phase of the Open House program. Please place them in the special boxes provided at all the information desks. Thanks!

LUNCH STANDS

Lunch stands serving soft drinks, hamburgers, hot dogs, ice cream, and potato chips will be located along the Open House route for your convenience. The stands will be located in the Ceramics lounge and in Room 165 Electrical Engineering Building. There will be signs to guide you to the stands.

TRANSPORTATION

Bus service will be provided between the Engineering campus and the Power Plant and Betatron. The bus stop on the campus will be between the Civil Engineering Hall and the Electrical Engineering Building on Burrill Street. This bus will run every half hour, leaving the campus on the half hour.

... OUR EXHIBITS ...

ROUTING

The route of the visitors covering the engineering campus has been arranged in the form of a circle. Thus, you may start at any building, and by following the routing arrows posted on walls, trees, and stakes at various points you will successively see every exhibit. The map in the center pages of this program indicates this route by a dotted line. Now here is the list of the various exhibits in the order of routing:

CIVIL ENGINEERING HALL

In this venerable building are housed, in addition to the Civil Engineering department, the offices of the Dean of the College of Engineering and the Engineering Library. The field of Civil Engineering is one of the broadest in the entire profession. Accordingly it is divided into the following options: hydraulic engineering, structural engineering, construction engineering, railway engineering, highway engineering, and sanitary engineering.

These options will each have many displays and demonstrations. Hydraulic engineering will construct a large working model of TVA's Fontana Dam. Many displays, photographs, models, and samples will be



displayed by the structural option. The construction option will show a model batcher which works with water instead of aggregate, models of pre-fab concrete construction, sift slab construction, and aggregate transfer.

The sanitary engineering option will display a mystic faucet that never quits running—not a bad feat considering it is connected to no water pipe! In addition to more serious models of a sewage treatment plant, a bacteriological display showing results of tests on the Boneyard water before and after treatment, and a fluoridation display along with a discussion by Mr. Phillip Voegtli who has done a special problem on the subject, will be a small water purification plant in actual operation on the south bank of the Boneyard.

Railway engineering is sponsoring an exhibit furnished by the Illinois Central Railway of a dynamometer test car brought down from Chicago. This car along with others will be located near Abbott Power Plant and the Betatron and can be seen when you are on that part of the campus.



ELECTRICAL ENGINEERING BUILDING

This is the center of our extensive Electrical Engineering department. Here you will see continuous demonstrations of many miracles of electricity and magnetism. There will also be periodical demonstration lectures on topics from this phase of engineering.

Among the interesting displays that you will see are actual flying saucers—no strings, no motors; but they actually fly! You will see a magnetic cannon in operation. It throws projectiles thirty feet or more. Also included will be a demonstration of an amplidyne generator, and cooking will be done by induction.

Have you heard of remote-controlled automobiles? Well, we have a remote-controlled skunk—completely controlled by radio waves. Pictures will be portrayed on oscilloscopes; a high voltage Tesla coil will be continuously operated. You can try your skill on the electronic football game, see the color organ, and blow out the magic light. There will be more serious demonstrations of magnetrons, radar, F.M., sonar, servo controls, and the Fairbanks-Everitt time compressor. Also featured will be a display of equipment, books, and reports that an electrical engineer needs and uses while in college.

Be sure to see the illumination exhibits. Continuous demonstrations will be given of special lighting effects, including beautiful black light effects. A completely new set of displays will be offered this year!

See these and many other astonishing exhibits in the Electrical Engineering display!

MATHEMATICS DEPARTMENT

This year, for the first time, we are privileged to have in our Open House a display by the Mathematics department. This display is located in the Electrical Engineering Building.

A good background in mathematics is the engineer's basic set of tools. An engineer without it is severely limited. The display consists of the basic symbols of math, three-dimensional models of many geometric and algebraic expressions, textbooks used here at the University, free literature, a large demonstration slide rule, and many other models.

TALBOT LABORATORY

The Arthur Newell Talbot Laboratory houses the department of Theoretical and Applied Mechanics and some portions of the Civil Engineering department. It is the outstanding building of its kind in the country.

The department of Theoretical and Applied Mechanics will test a large concrete cylinder once every other hour on the half hour. The explosive-like failure, shown below, will actually shake the building. The testing machine which will be used is four stories high and has a capacity of three million pounds. It is the largest testing machine of this type in the Midwest.

You will see water, flowing in a glass-walled channel, suddenly jump upward to form a nearly vertical wall of water. This extremely interesting phenomenon is known as the "hydraulic jump." Also in operation will be the pumps, turbines, weirs, and a water tunnel which are used in laboratory classes in fluid mechanics.

You can amaze your friends by showing them that you can bend a 2½-inch round brass beam with your little finger. An extremely sensitive electrical device is used to measure very small amounts of bending

and will prove that you can bend the beam with your little finger. A rapidly vibrating metal bar will be "stopped" instantly by a beam of light. Vibration measuring instruments, operation models of various vibration systems, and a gyroscope will be on display.

Solid lead will be squeezed through a small hole to form a slender lead ribbon in a typical class demonstration of the extrusion process of forming structural metal members. Other class activities that will be in operation include pulling steel bars in two and crushing wood blocks.

Metals get tired, too! You will see on the top floor metals fractured by many millions of repetitions of load in the Fatigue of Metals Laboratory and metals fractured after many years of steady load at elevated temperature in the Creep of Metals Laboratory.

Research in Structural Engineering, a part of the Civil Engineering department's program, is concentrated in the two large crane bays of Talbot Laboratory, where you will see parts of large steel and concrete structures being tested. In the four large 200,000-lb. fatigue machines, bridge members can be loaded in days with loads which represent fifty years of service in a bridge. These tests as well as the many others in progress are designed to provide everyone with safer and more economical bridges and buildings.



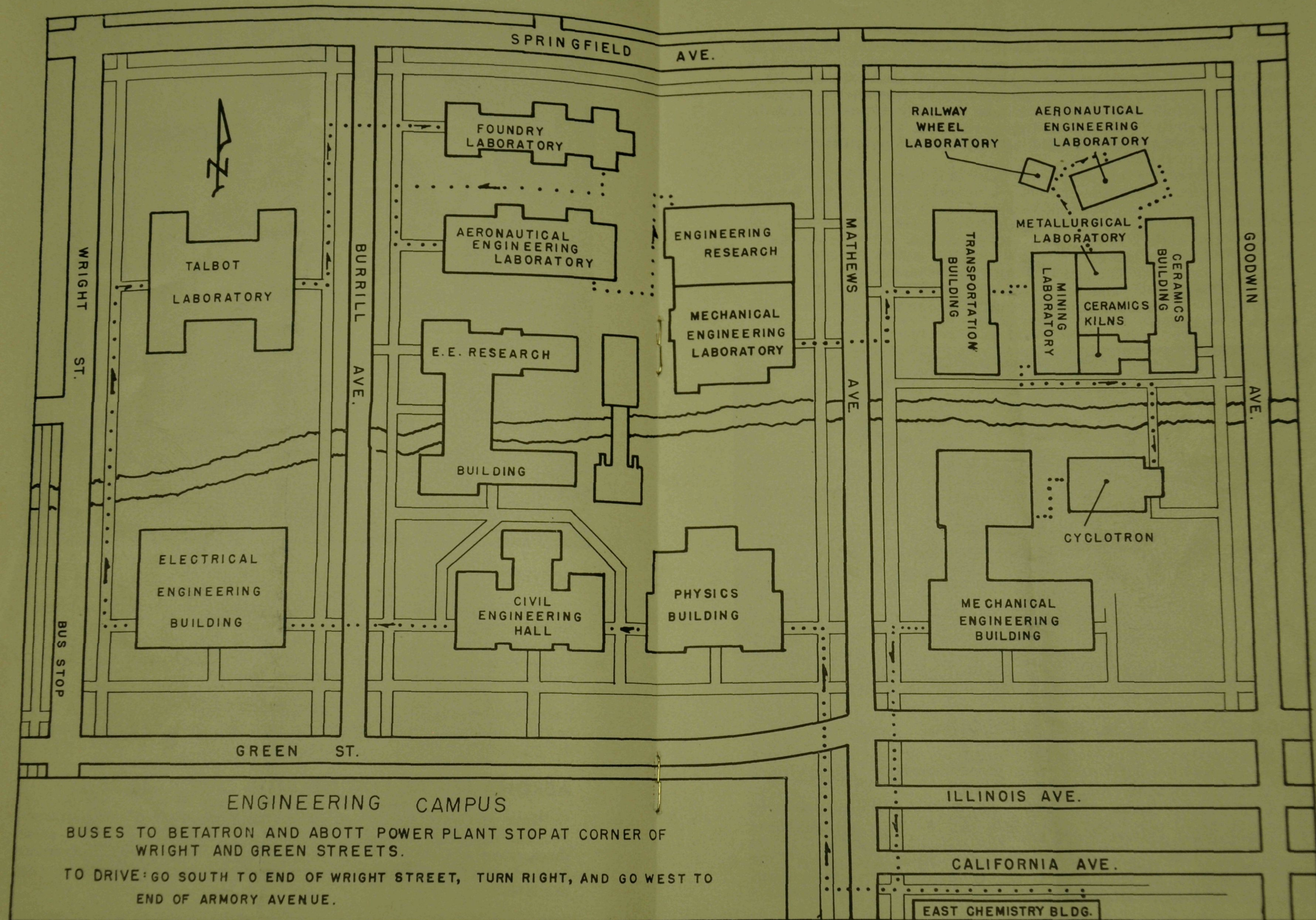
FOUNDRY

The foundry is a part of the Mechanical Engineering department. In order to produce a satisfactory casting, the design of patterns and the correlation between the pattern and the casting must be studied. Students use this laboratory for studying and applying the methods of melting, handling, and pouring molten metal.

This laboratory contains various types of molding machines, furnaces, and equipment. Also, there will be a number of displays showing castings and patterns for use by the students who are studying pattern design.

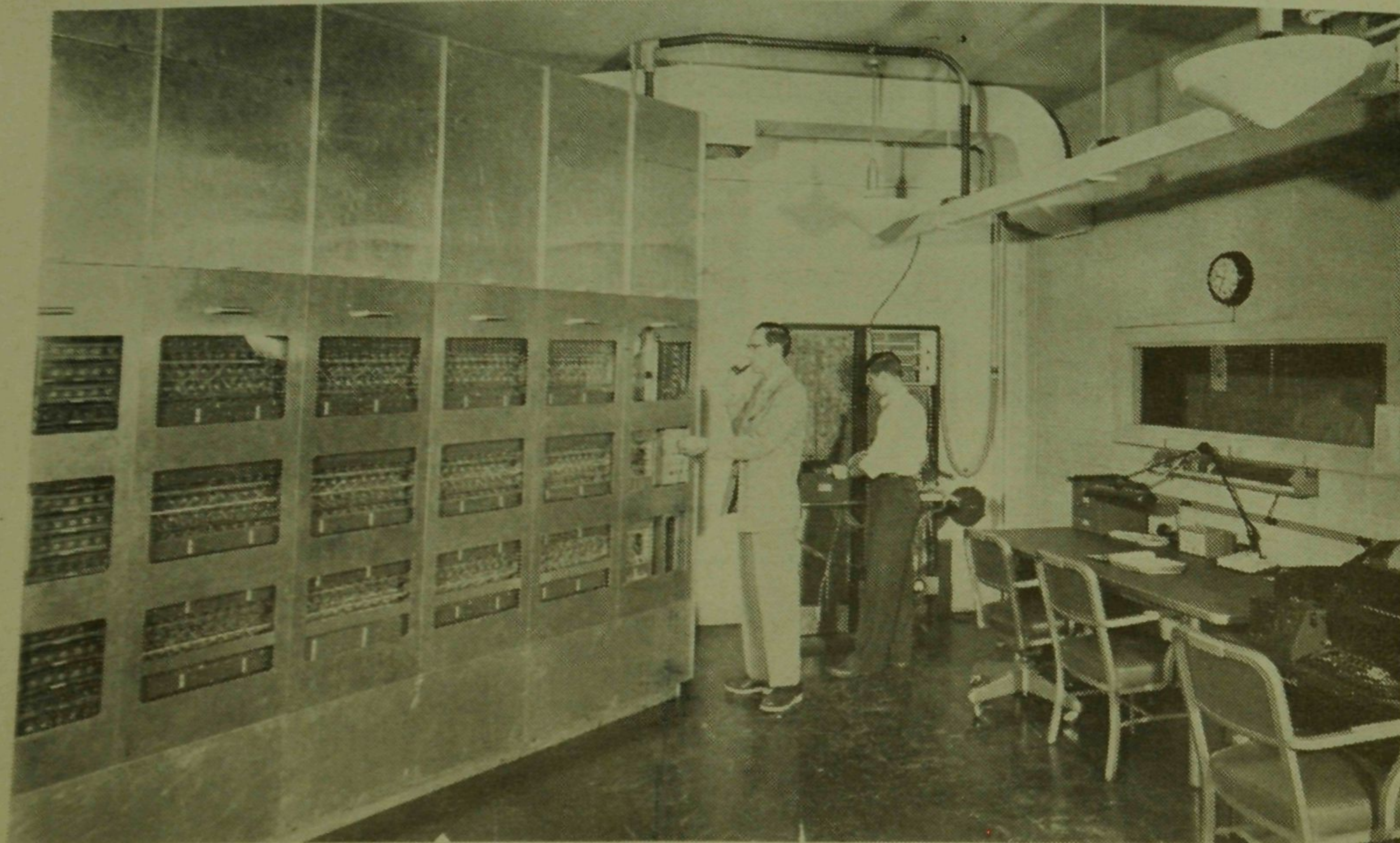
AERONAUTICAL ENGINEERING LABORATORIES

Have you ever wanted to be behind the controls of an airplane? Wonder what the inside of a rocket motor looks like? Curious about shock waves? Then don't fail to stop in at Aeronautical Engineering Labs A and B, where you'll see these and many other interesting exhibits.



At Aero Lab A, see the wind tunnel in operation, a device which makes possible the measurement of lift and drag forces on an airfoil at various speeds. In Laboratory B, a smoke tunnel presents a visual picture of the flow of air about a body by means of smoke streams. At a nearby display, you can actually see shock waves generated by a supersonic-type airfoil. The huge shock tube, centrally located in Lab B, permits the study of air flow and pressures about a body at supersonic speeds; the Schlieren photographic processes used to record the pressure distribution in the shock tube.

Be prepared for an ear-splitting roar as a tiny ram-jet, no bigger than your fist, bursts into life. See a cutaway model of the famous Walther rocket engine, which powered the deadly Luftwaffe interceptor aircraft of World War II. A multitude of power plants will be on display—the world's largest pulse jet, a valveless pulse jet developed at this University, the first turboprop engine, a J-35 turbojet engine (used in the famed Thunderjet F-84G fighter-interceptor, an R-2850 reciprocating engine, and many others). Color movies showing late developments in aeronautical research will be shown at frequent intervals during the exhibit.



ENGINEERING RESEARCH BUILDING

Here for the second time in the history of our Engineering Open House you will be able to see the million-dollar *Illiac*, the electronic digital computer of the University of Illinois.

One of the few digital computers of its size in the United States and the world, the *Illiac* is one of the outstanding examples of the achievements of our College of Engineering. During most of the Open House the *Illiac* will be working actual problems which have arisen from research programs being carried out at this university; however, it will be open for inspection at all times.

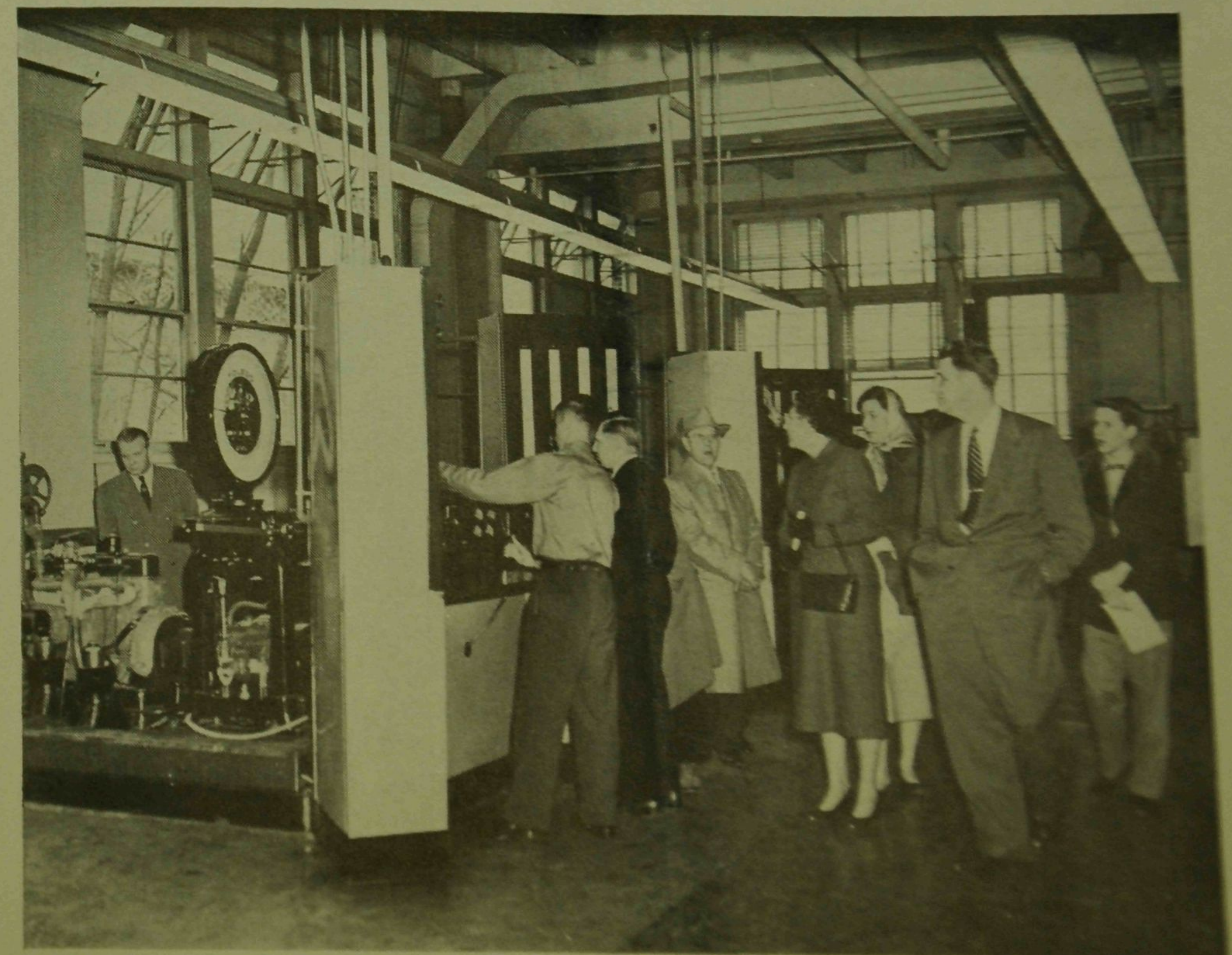
The *Illiac* will be stopped for special demonstrations to Open House guests at the following times: Friday, March 11 at 11:00 A.M., 2:00, 4:00, 8:00, and 9:00 P.M.; and Saturday, March 12 at 10:30 and 11:30 A.M., and 2:00 P.M. You won't want to miss this world-famous piece of equipment being shown through the courtesy of the Graduate College by the Electrical Engineering department.

MECHANICAL ENGINEERING LABORATORY

The student at Illinois has a wide variety of mechanical equipment at his disposal in the Mechanical Engineering Laboratory. The majority of this equipment is used in conducting performance tests and in becoming familiar with the theoretical and practical problems that arise through the use of these machines. In addition to student test equipment, there are many research projects and pieces of experimental apparatus used for graduate and faculty investigations.

Available for student use is a complete model steam power-electric generating unit; steam engines and steam turbines; gasoline and diesel engines; air compressors, fans and pumps; heating, air-conditioning and refrigeration equipment; reaction brake tester, and various instruments and control devices for flow processes. Included in the category of research projects, are the permanent test facilities of the Cold Room, the Warm Wall test booth, and the Physical Environment Laboratory.

The purpose of the Cold Room is to study the controlled environment effects of heating and ventilation. Currently, extensive studies in the air distribution for year-round air-conditioning are being conducted.



The aim of the studies in the Warm Wall test booth, is to determine the rating conditions for hot water baseboard radiators.

The Physical Environmental Test Unit allows the environmental factors of temperature, pressure, and humidity to be varied over wide ranges, so that the physiological and psychological effects of these variables upon both animal and human subjects may be studied by various agencies in the University.

AGRICULTURAL ENGINEERING

Due to the distance the Agricultural Engineering buildings are removed from the main engineering campus, special exhibits showing the application of engineering principles to agricultural problems will be displayed in the southwest section of the Mechanical Engineering Laboratory. The exhibit will include displays of farm mechanization; rural electrification; farm building design; and irrigation, drainage, and soil conservation.

The Agricultural Engineering Research Laboratory and class room buildings on the south campus will be open to the public during the Open House. Ample parking facilities adjoining the buildings and free bus service from the engineering campus will be provided.

TRANSPORTATION BUILDING

The Transportation Building contains the classrooms, drafting rooms, and offices of the department of General Engineering. Since drawing is the universal language used by the engineer to convey his plans and ideas to others, every engineering student is required to attain some proficiency in this field.

You will see the exhibits of student problems in these courses: production illustration, descriptive geometry, machine drawing, architectural drawing, geological drawing, aircraft drafting and lofting, graphical computations, perspective drawing, and advanced drafting for mechanical and civil engineers.

There will also be demonstrations of the airbrush and doubletone, lettering machines, pantograph, ellipse machine, and machines for reproducing drawings. A map showing the geological structure of this state will be displayed, as well as drawings made on plastic and more than fifty different slide rules. You will have a chance to try some of these pieces of drafting equipment.

MINING LABORATORY

In the Mining Laboratory of the department of Mining and Metallurgical Engineering you will have a chance to prospect with "black light" lamps for minerals or to hunt for uranium and radioactive ores with a Geiger counter, exactly as in your dreams. Diamond drilling of the hardest rocks will be demonstrated.

There will be a display of every day's most common fuels (coal, petroleum, etc.) and ores (iron, copper, lead, etc.) and of equipment to break it from the ground and to crush it finer than face powder.

There will be models of mining methods, bringing coal in 30 minutes from the workings through the washing plant to the railroad cars.

Separation of minerals and oil froth flotation will be demonstrated, as well as coal washing. Mine ventilation, mine safety lamps, and lurgical operations will be shown frequently in Room 203 of the Metallurgy Laboratory.

METALLURGY LABORATORY

The Metallurgy Laboratory is the center of the Metallurgy department. In this exhibit you will see displays and demonstrations on the production of metals from their ores, the microstructure of metals magnified a thousand times, and modern research and development. Actual research being performed by professors and graduate students in their laboratories will be included on the route, and you will see them growing crystals from invisible nuclei and the structure of metals by X-ray diffraction and with the electron microscope. You will hear metal cry out loud and see many other demonstrations performed that you won't want to miss! Any instructor or student will be happy to answer any question that you might have about metallurgy.

CERAMICS BUILDING

As its name indicates, this is the headquarters of the Ceramic Engineering department—one of the most useful and important branches of engineering.

The Ceramic Engineering exhibit consists of the following six main divisions: *glass*—showing the results of modern glass technology as applied to a variety of home and industrial uses, *enamels*—illustrating the versatility of porcelain enamels in everyday use and including a complete porcelain enameling operation from the smelting of the raw materials to the finished product, *refractories*—illustrating linings in blast furnaces, glass tanks, etc., and sample refractory materials and examples of their use, together with a working model showing the processes taking place from the time the raw materials are obtained until the refractory is ready for the consumer, *structural clay products*—showing typical structural clay products which have added to the advance of our present-day civilization, *whitewares*—showing the steps in making whiteware bodies and demonstrating the important properties of ceramic whitewares, including such operations as the Ram process, jiggering, and casting, and *abrasives*—depicting the processes involved in combining the abrasives and binders to form abrasive wheels, disks, and belts.

Ceramic engineering students and staff will be available to discuss with all who are interested the various aspects of Ceramic Engineering and its future.

CYCLOTRON BUILDING

The Cyclotron Building is a part of the Physics department. Here you will be able to see the famous University of Illinois cyclotron, a device used for the acceleration of particles in atomic and nuclear physics research. Guided tours will be conducted continuously through the building, and you will actually see all the awesome equipment of modern research in physics.

MECHANICAL ENGINEERING BUILDING

This modern building was completed in 1949. It contains all of the up-to-date instructional facilities and educational equipment necessary for effective learning.

In the laboratory facilities of this building, emphasis is placed on both the theoretical and practical engineering and economic principles in the design and performance of mechanical equipment and processes.

This building contains sixteen test and research laboratories which include 29,316 square feet of floor space and thirteen classrooms occupying 9,260 square feet of area. Largest of the laboratories is the machine tool laboratory containing more than 100 machine tools for the processing of metal parts used in several standard student projects.

The Internal Combustion Engine Laboratory contains modern gasoline and diesel engines connected to dynamometers for purposes of performance testing and experimental research.

Also on exhibit, is the Heat Treatment Laboratory which is used by junior and senior students to obtain experience in the heat treatment processes of metals.

The welding laboratory provides facilities for all types of welding and flame cutting with appropriate equipment for determining strength of the finished weld.

Special laboratories for studies of problems in instruments and controls, fuels and lubricants, heat transfer, and thermodynamics have been provided. These laboratories provide space for equipment upon which basic research may be accomplished both at the graduate and undergraduate level.

CHEMICAL ENGINEERING BUILDING

The home of the Chemical Engineering department also contains quite a few surprises for our visitors. The preparation of bouncing putty and a demonstration of liquid air will be only a few of the many astonishing demonstrations on the Chemical Magic Show, to be offered every hour on the hour.

There will be several unit operations being shown continuously. In the treatment of raw ores crushing will be done in roller crushers, jaw crushers, and cone crushers. Milling machines and pulverizers will be operating, as well as screening equipment. A continuous rotary filter and an absorption column are also a few of the exhibits to be offered.

Chemical engineering students will be available to discuss with all who are interested the possibility of choosing chemical engineering as a profession.



PHYSICS LABORATORY

The Physics Society of the University of Illinois welcomes you to its exhibits and demonstrations, designed and built by its members, of the various phases of applied physical sciences. These exhibits are designed to acquaint you with the main fields of sound, heat, light, mechanics, and electronics, as well as atomic and nuclear physics. There also will be a high voltage display and a spectacular demonstration of low-temperature physics, as well as many other displays and demonstrations.

Besides the exhibits in the Physics Laboratory, the department of Engineering Physics also sponsors the exhibits in the Cyclotron and Betatron Laboratories, listed under those titles in this program.

R. O. T. C. EXHIBITS

In addition to all other exhibits, the Army, Navy, and Air Force Reserve Officers' Training Corps units will have exhibits and training aids at various points along the Open House route.

ABBOTT POWER PLANT AND BETATRON BUILDING

The power plant of the University will be open for general inspection. Here you will see power-generating machinery under actual working conditions.

Across the street from the power plant you will be able to visit the famous Betatron in the Physics Research Building. There will be guided

tours with explanations of this famed research device. Be sure not to miss this extremely interesting tour through this scientific wonderland.

The power plant and the Betatron are located at Oak and Gregory Streets in Champaign on the southwest part of the campus and can be reached by going west on Gregory or Armory Streets to their termination. Armory Street begins at the south end of Wright Street.

Be sure not to forget the Illinois Central test car and train located on the tracks west of Abbott Power Plant. This is an exhibit you'll find highly interesting.

... AND FINALLY, OUR THANKS!

A project like the Engineering Open House requires an immense amount of time and effort from a great many students, faculty, and staff members of the College of Engineering and other departments closely associated with engineering, as well as many of their friends. Here we wish to thank once more everyone who has contributed his efforts toward the success of the 1955 Engineering Open House at the University of Illinois and to all who came to view and, we hope, enjoy our work.

Our special thanks go to Ken Padgitt for his cover design and to Al Sokolow for his photographic work on last year's Open House.

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OPEN HOUSE PERSONNEL

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Francis Woolridge, campus

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Tom Lund, special effects
Joe Cannella, physical plant liaison
Bill Day, lunch stands
Vito Dimucci, room reservations

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Don Lackowski, program
Jack Fooks, bids
Don Heid, decorations
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